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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/002,781

10/29/2001

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SLA1031

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11/17/2006

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EXAMINER

MURPHY, DILLON J

ART UNIT

PAPER NUMBER

2625

DATE MAILED: 11/17/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Art Unit: 2625

DETAILED ACTION

- This action is responsive to the amendment filed on August 25, 2006.
- Claims 1-3, 5, and 7-17 are pending. Claim 18 is canceled.

Claim Objections

Claim 13 is objected to because of the following informalities: on line 10, the word "and" should be inserted after the semicolon ";". Appropriate correction is required.

Claim 14 is objected to because of the following informalities: on line 9, the word "and" should be inserted after the semicolon ";". Appropriate correction is required.

Claim 16 is objected to because of the following informalities: on line 9, the word "and" should be inserted after the semicolon ";". Appropriate correction is required.

Claim Rejections - 35 USC § 101

The 35 U.S.C. 101 rejection of claim 18 has been withdrawn.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-3, 5, 9-11, 13, 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takeda (US 6,229,622) in view of Wanda (US 6474881).

Regarding claim 1, Takeda teaches a method for interleaving print jobs, said method comprising:

Receiving a plurality of original print jobs at a non-printer computing device (Takeda, col 4, ln 66-67, and col 5, ln 1-8, wherein the spool area in the hard drive receives a plurality of print jobs. Also see fig 2, wherein spool area receives print jobs. Jobs are received by a non-printer computing device. See col 10, ln 63-67, and col 11, ln 1-3, wherein interleaving functions according to Takeda may be performed in part or entirely by a computer, i.e. a non-printer computing device);

Partitioning at least one of said original print jobs into a plurality of sub-jobs with said non-printer computing device (Takeda, col 5, ln 11-52, print jobs are partitioned into sub-jobs of size P_x , where P_x is the number of pages per sub-job. Also see col 4, ln 42-45, for example, wherein jobs larger than a predetermined size are partitioned into a plurality of sub-jobs);

Tagging said plurality of sub-jobs with an output mode code wherein said output mode code is the same for sub-jobs originating from the same original print job (Takeda, col 5, ln 59-64, wherein each sub-job P_x stored in each spool area are sent to switching stackers, i.e. output trays. Inherently, each sub-job must be tagged with an output mode code in order for sub-jobs to be collected on a per-user basis. Sub-jobs that are collated on a per-user basis are inherently tagged with the same output code originating from the same original user job); and

Interleaving said sub-jobs and any remaining original print jobs with said non-printer computing device (Takeda, col 5, ln 11-52, printing operation prints all pages "Px" of sub-job "X," and then moves to next sub-job. When all sub-jobs have been processed, operation loops back to first print job's sub-jobs. See col 5, ln 53-58, for printing and spooling. Also see fig 3B, wherein processing of jobs is continued until print data no longer remains, S7 and S13).

Takeda does not disclose expressly a method comprising generating a combined print job comprising a plurality of user jobs. Wanda, however, teaches a method of printing comprising generating a combined print job comprising a plurality of user jobs (Wanda, col 8, ln 61- col 9, ln 10, wherein individual jobs are grouped into a group job at a non-printer computing device. See fig 16 for example of a group job comprising a plurality of individual jobs, col 14, ln 17-21). Modifying the method of Tanaka with the teachings of Wanda causes a combined job to be generated comprising the interleaved sub-job and original jobs.

Takeda and Wanda are combinable because they are from a similar field of endeavor of network printing multiple jobs concurrently. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the method of Wanda comprising generating a combined print job with the method of Tanaka for interleaving print jobs comprising receiving a plurality of print jobs, partitioning the print jobs, tagging the sub-jobs, and interleaving the print jobs. The motivation for doing so would have been to generate a group of plurality of jobs so as to not allow other print jobs to interrupt in the group job (Wanda, col 1, ln 44-50), while also not inhibiting

Art Unit: 2625

printing if a job in a group is not ready to print (Wanda, col 1, ln 61-col 2, ln 9).

Therefore, it would have been obvious to combine Wanda with Takeda to obtain the invention as specified in claim 1.

Regarding claim 2, which depends from claim 1, the combination of Takeda and Wanda teaches a method for interleaving print jobs wherein said non-printer computing device is a computing device (Takeda, col 10, ln 63-67, and col 11, ln 1-3, wherein interleaving functions may be performed in part or entirely by a client computing device or in a server as taught by Wanda).

Regarding claim 3, which depends from claim 1, the combination of Takeda and Wanda teaches a method for interleaving print jobs wherein said non-printer computing device is a network print server (Wanda, col 5, ln 1-21, and fig 1, server #101, wherein server manages grouping of print jobs. A server as taught by Wanda reads on a computing device as taught by Takeda).

Regarding claim 5, which depends from claim 1, the combination of Takeda and Wanda teaches a method for interleaving print jobs wherein said partitioning is performed by a software print system component in an operating system print server (According to Takeda in col 10, ln 42-45, the method of interleaving may be applied to a system constituted by a plurality of devices (e.g., a computer, interface, reader, printer, etc. A server as taught by Wanda reads on a computer. In Wanda, col 6, ln 51-55, the grouping and print control is performed by a print control program in the server. The server is a operating system print server, col 5, ln 30-45).

Regarding claim 9, which depends from claim 5, the combination of Takeda and Wanda teaches a method for interleaving print jobs wherein said print system component is a network print driver (Wanda, fig 3, and col 6, ln 30-38, wherein network printer control program #303 reads on a print driver).

Regarding claim 10, which depends from claim 1, the combination of Takeda and Wanda further teaches a method wherein said partitioning results in sub-jobs of approximately equal size (Takeda, col 4, ln 40-44, number of pages, Px, of sub-jobs can be controlled independently for each user or set to be equal for all sub-jobs, col 4, ln 54-55).

Regarding claim 11, which depends from claim 1, the combination of Takeda and Wanda further teaches a method wherein said partitioning results in sub-jobs of approximately equal printing time (Takeda, col 4, ln 44-45, size of sub-jobs may alternatively be set to length of time rather than amount of data).

Regarding claim 13, the combination of Takeda and Wanda (as combined in claim 1) teaches a method for interleaving print jobs, said method comprising:

Receiving a plurality of original print jobs at a non-printer, print system component before said original print jobs arrive at a printer (Takeda, col 4, ln 66-67, and col 5, ln 1-8, wherein the spool area in the hard drive receives a plurality of print jobs. Also see fig 2, wherein spool area receives print jobs. Jobs are received by a non-printer computing device. See col 10, ln 63-67, and col 11, ln 1-3, wherein interleaving functions according to Takeda may be performed in part or entirely by a computer, i.e. a non-printer computing device);

Art Unit: 2625

Partitioning at least one of said original print jobs into a plurality of sub-jobs with said print system component (Takeda, col 5, ln 11-52, print jobs are partitioned into sub-jobs of size P_x , where P_x is the number of pages per sub-job. Also see col 4, ln 42-45, for example, wherein jobs larger than a predetermined size are partitioned into a plurality of sub-jobs);

Tagging said plurality of sub-jobs with an output mode code wherein said output mode code is the same for sub-jobs originating from the same original print job (Takeda, col 5, ln 59-64, wherein each sub-job P_x stored in each spool area are sent to switching stackers, i.e. output trays. Inherently, each sub-job must be tagged with an output mode code in order for sub-jobs to be collected on a per-user basis. Sub-jobs that are collated on a per-user basis are inherently tagged with the same output code originating from the same original user job);

Generating a combined print job (Wanda, col 8, ln 61- col 9, ln 10, wherein individual jobs are grouped into a group job at a non-printer computing device. See fig 16 for example of a group job comprising a plurality of individual jobs, col 14, ln 17-21), wherein said generating comprises (Modifying the method of Tanaka with the teachings of Wanda cause a combined job to be generated comprising the interleaved sub-job and original jobs, as combined above in claim 1) interleaving said sub-jobs and any remaining original print jobs with said print system component (Takeda, col 5, ln 11-52, printing operation prints all pages " P_x " of sub-job " X ," and then moves to next sub-job. When all sub-jobs have been processed, operation loops back to first print job's sub-

Art Unit: 2625

jobs. See col 5, ln 53-58, for spooling and printing. Also see fig 3B, wherein processing of jobs is continued until print data no longer remains, S7 and S13).

Regarding claim 16, the combination of Takeda and Wanda teaches a system for interleaving print jobs before said print jobs arrive at a printer, said system comprising:

A receiver for receiving a plurality of original print jobs, before said original print jobs arrive at a printer (Takeda, col 4, ln 66-67, and col 5, ln 1-8, wherein the spool area in the hard drive receives a plurality of print jobs. Also see fig 2, wherein spool area receives print jobs. Jobs are received by a non-printer computing device. See col 10, ln 63-67, and col 11, ln 1-3, wherein interleaving functions according to Takeda may be performed in part or entirely by a computer, i.e. a non-printer computing device);

A partitioner for partitioning at least one of said original print jobs into a plurality of sub-jobs (Takeda, col 5, ln 11-52, print jobs are partitioned into sub-jobs of size P_x , where P_x is the number of pages per sub-job. Also see col 4, ln 42-45, for example, wherein jobs larger than a predetermined size are partitioned into a plurality of smaller sub-jobs. Partitioning is performed by operations in spooler);

A tagger for tagging said plurality of sub-jobs with an output mode code wherein said output mode code is the same for all said sub-jobs originating from the same original print job (Takeda, col 5, ln 59-64, wherein each sub-job P_x stored in each spool area are sent to switching stackers, i.e. output trays. Inherently, each sub-job must be tagged with an output mode code in order for sub-jobs to be collected on a per-user basis. Sub-jobs that are collated on a per-user basis are inherently tagged with the

Art Unit: 2625

same output code originating from the same original user job. Tagging is performed by spooling unit); and

A combiner for forming a combined print job (Wanda, col 8, ln 61- col 9, ln 10, wherein individual jobs are grouped into a group job at a non-printer computing device. See fig 16 for example of a group job comprising a plurality of individual jobs, col 14, ln 17-21), wherein said combiner comprises (Modifying the method of Tanaka with the teachings of Wanda cause a combined job to be generated comprising the interleaved sub-job and original jobs, as combined above in claim 1) an interleaver for interleaving said smaller sub-jobs and any remaining original print jobs in an alternating sequence of print jobs (Takeda, H/D (Hard drive) #202 comprises spooler area which comprises methods for partitioning and interleaving print jobs. See col 5, ln 11-52, print jobs are partitioned into sub-jobs of size Px, where Px is the number of pages per sub-job. The printing operation prints all pages "Px" of sub-job "X," and then moves to next sub-job. When all sub-jobs have been processed, operation loops back to first print job's sub-jobs. See col 5, ln 53-58, for spooling and printing. Also see fig 3B, wherein processing of jobs is continued until print data no longer remains, S7 and S13).

Regarding claim 17, claim 17 recites identical features as claim 1 except claim 17 is a computer readable medium claim. Thus, arguments similar to that presented above for claim 1 are equally applicable to claim 1. See Takeda, col 2, ln 23-30, wherein printing operation is performed by program in RAM, while hard drive stores a plurality of applications to be run by CPU. Also see Takeda, col 10, ln 63-67, and col 11, ln 1-3,

Art Unit: 2625

steps are performed by executing program codes read by a computer, separate from a printing device.

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Takeda (US 6,229,622) in view of Wanda (US 6474881) and further in Utsunomiya et al. (US 5,822,500).

Regarding claim 7, which depends from claim 5, the combination of Takeda and Wanda teach a method for interleaving print jobs comprising receiving print jobs, partitioning said jobs into sub-jobs, tagging said sub-jobs, generating a combined print job, and interleaving said sub-jobs in a sequence, wherein the receiving, and interleaving are performed at a non-printer computing device and wherein the partitioning is performed by a software print system component in an operating system print server, as explained above in the rejection of claim 5. The combination of Takeda and Wanda does not disclose expressly a method for interleaving print jobs wherein said print system component is independent of an operating system print driver.

Utsunomiya, however, teaches a method for interleaving print jobs wherein said print system component is independent of an operating system print driver (Utsunomiya, col 5, ln 58-67 and col 6, ln 1-11, partitioning of print jobs is performed by CPU, wherein CPU operates independently of an operating system print driver, i.e. without a driver).

Takeda, Wanda, and Utsunomiya are combinable because they are from a similar filed of endeavor of print processing. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the method of

Art Unit: 2625

Utsunomiya comprising a print system component that is independent of an operating system print driver with the combination of Takeda and Wanda comprising a method for interleaving print jobs comprising receiving print jobs, partitioning said jobs into sub-jobs, tagging said sub-jobs, generating a combined print job, and interleaving said sub-jobs in a sequence, wherein the receiving, and interleaving are performed at a non-printer computing device and wherein the partitioning is performed by a software print system component in an operating system print server. The suggestion for doing so would have been to provide a printer apparatus and method of controlling the same, in which a later printing job can be executed before an earlier print job is finished, thereby making it possible to improve the efficiency of the overall printing system (Takeda, col 1, ln 32-36), as well as providing centralized control in the form of a server to combine an image processing apparatus which can be connected to a plurality of data generating sources (Utsunomiya, col 1, ln 41-43). Therefore, it would have been obvious to combine Utsunomiya with the aforementioned combination of Takeda and Wanda to obtain the invention as specified in claim 7.

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Takeda (US 6,229,622) in view of Wanda (US 6,474,881) and further in view of Keeney et al. (US 6,748,471).

Regarding claim 8, which depends from claim 5, the combination of Takeda and Wanda teach a method for interleaving print jobs comprising receiving print jobs, partitioning said jobs into sub-jobs, tagging said sub-jobs, generating a combined print

Art Unit: 2625

job, and interleaving said sub-jobs in a sequence, wherein the receiving, and interleaving are performed at a non-printer computing device and wherein the partitioning is performed by a software print system component in an operating system print server, as explained above in the rejection of claim 5. The combination of Takeda and Wanda does not disclose expressly a method for interleaving print jobs wherein said print system component is a network print spooler that is independent of a printer. Keeney, however, teaches a method wherein said print system component is a network print spooler that is independent of a printer (Keeney, col 6, ln 42-44, jobs are received by spooling server, also see fig 9, wherein a plurality of jobs are in print job storage #52. After jobs are received by spooling server of Keeney, partitioning by a software print system component in an operating system print server continues as taught by Takeda and Wanda).

Takeda, Wanda, and Kenney are combinable because they are from a similar field of endeavor of print processing. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the method of Keeney comprising using a network print spooler that is independent of a printer with the combination of Takeda and Wanda comprising a method for interleaving print jobs comprising receiving print jobs, partitioning said jobs into sub-jobs, tagging said sub-jobs, generating a combined print job, and interleaving said sub-jobs in a sequence, wherein the receiving, and interleaving are performed at a non-printer computing device and wherein the partitioning is performed by a software print system component in an operating system print server. The motivation for doing so would have been to provide

Art Unit: 2625

a repository that is accessible, e.g., via a global communication network such as the Internet, to authorized users at any time of day (Keeney, col 6, ln 27-30). Therefore, it would have been obvious to combine Keeney with the aforementioned combination of Takeda and Wanda to obtain the invention as specified in claim 8.

Claim 12, 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takeda (US 6,229,622) in view of Wanda (US 6,474,881) and further in view of Rabjohns et al. (US 5,697,040).

Regarding claim 12, which depends from claim 1, the combination of Takeda and Wanda teaches a method for interleaving print jobs comprising receiving print jobs, partitioning said jobs into sub-jobs, tagging said sub-jobs, generating a combined print job, and interleaving said sub-jobs in a sequence. The combination of Takeda and Wanda does not disclose expressly a method wherein said interleaving places sub-jobs originating from smaller original print jobs toward the front of the print order. Rabjohns, however, teaches a method for interleaving print jobs wherein said interleaving places sub-jobs originating from smaller original print jobs toward the front of the print order (Rabjohns, col 6, ln 12-18, smaller jobs are interleaved into larger jobs, moving the smaller jobs towards the front of the print order).

Takeda, Wanda and Rabjohns are combinable because they are from the same field of endeavor of print interleaving. At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the method of inserting smaller print jobs towards the front of the print order of Rabjohns with the method of Takeda for

Art Unit: 2625

interleaving print jobs comprising receiving print jobs, partitioning said jobs into sub-jobs, tagging said sub-jobs, generating a combined print job, and interleaving said sub-jobs in a sequence. The suggestion for doing so would have been to provide a printer apparatus and method of controlling the same, in which a later printing job can be executed before an earlier print job is finished, thereby making it possible to improve the efficiency of the overall printing system (Takeda, col 1, ln 32-36), and to blend images of a second job with the images of a first job during the first job processing (Rabjohns, col 2, ln 8-11), especially when said second job is smaller in length than said first job. Additionally, the suggestion for combining multiple components was given by Takeda in col 10, ln 42-45, wherein the method of interleaving of Takeda may be applied to a system constituted by a plurality of devices (e.g., a host computer, interface, reader, printer, etc.). Therefore, it would have been obvious to combine Rabjohns with the combination of Takeda and Wanda to obtain the invention as specified in claim 12.

Regarding claim 14, the combination of Takeda, Wanda and Rabjohns further teaches a method for reducing delay of smaller print jobs in a print queue, said method comprising:

Receiving a plurality of original print jobs at a print system component before said original print jobs arrive at a printer (Takeda, col 3, ln 17-20, printer apparatus receives jobs from network via LAN, also col 5, ln 11-15, print jobs stored in memory, with each job corresponding to an indices "X," indicating a plurality of jobs. As is taught by Takeda, part of or all of interleaving functions may be performed by a separate computer, i.e. before a printer, or in discrete network components, wherein the printer is

Art Unit: 2625

the last step), said plurality of original print jobs comprising at least one larger print job and at least one smaller print job (Rabjohns, col 6, ln 12-18, smaller jobs are interleaved into larger jobs, moving the smaller jobs towards the front of the print order);

Partitioning said larger original print job into a plurality of sub-jobs (Takeda, col 5, ln 11-52, print jobs are partitioned into sub-jobs of size P_x , where P_x is the number of pages per sub-job);

Tagging said smaller sub-jobs with an output mode code (Takeda, col 5, ln 59-64, wherein each sub-job P_x stored in each spool area are sent to switching stackers, i.e. output trays. Inherently, each sub-job must be tagged with an output mode code in order for sub-jobs to be collected on a per-user basis. Sub-jobs that are collated on a per-user basis are inherently tagged with the same output code originating from the same original user job);

Forming a combined print job (Wanda, col 8, ln 61- col 9, ln 10, wherein individual jobs are grouped into a group job at a non-printer computing device. See fig 16 for example of a group job comprising a plurality of individual jobs, col 14, ln 17-21), wherein said forming (Modifying the method of Tanaka with the teachings of Wanda cause a combined job to be generated comprising the interleaved sub-job and original jobs) comprises interleaving said sub-jobs with said smaller original print job (Takeda, col 5, ln 11-52, printing operation sends all pages " P_x " of sub-job " X " to a printer, and then moves to next sub-job. When all sub-jobs have been processed, operation loops back to first print job's sub-jobs, thereby printing in order).

Art Unit: 2625

Regarding claim 15, which depends from claim 14, the combination of Takeda, Wanda and Rabjohns further teaches a method further comprising partitioning said smaller original print job into sub-jobs and wherein said interleaving comprises interleaving said sub-jobs from said larger print job with said smaller sub-jobs from said smaller print job (Takeda, col 5, ln 11-52, print jobs are partitioned into sub-jobs of size P_x , where P_x is the number of pages per sub-job. Also see Rabjohns, col 7, ln 7-19, both small and large jobs are partitioned into smaller sub-jobs and interleaved to improve printer efficiency).

Response to Arguments

Applicant's arguments, see Remarks, filed August 25, 2006, with respect to the rejection(s) of claim(s) 1, 2, 10, 11, 13, 17, and 18 under 35 U.S.C. 102e have been fully considered and are persuasive. The examiner agrees that Takeda does not teach generating a combined print job. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Wanda (US 6474881).

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The d'Entrecasteaux reference (US 20060033958) is cited for teaching a printing system and method for interleaving printing jobs including generating a combined job.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dillon J. Murphy whose telephone number is (571) 272-5945. The examiner can normally be reached on M-F, 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kimberly Williams can be reached on (571) 272-7471. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2625

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DJM
November 11, 2006



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